

U.S. Serial No.: 10/615,112
Amendment dated June 27, 2005
Reply to Office Action of March 25, 2005

IN THE CLAIMS:

WHAT IS CLAIMED IS:

Claim 1 (Currently Amended). A sensor assembly for independently sensing direction of rotation and/or position of an object, the assembly comprising:

a target wheel;

a pair of sensing elements configured to generate respective signals as the wheel rotates in response to structure on the target wheel;

a first circuit coupled to receive a signal from at least one of the sensing elements for detecting direction of rotation of the target wheel; and

a second circuit coupled to receive each signal from the sensing elements for detecting position of the target wheel, wherein the first and second circuits comprise independent circuits from one another, and is each directly connected to said pair of sensing elements, whereby the detection of rotation direction by said first circuit is independent from the detection of position by said second circuit.

Claim 2 (Original). The sensor assembly of claim 1 wherein said first circuit comprises a pair of circuit stages, each of said stages coupled to respectively receive a signal from a respective one of the sensing elements.

Claim 3 (Currently Amended). The sensor assembly of claim 2 further comprising a flip-flop coupled to receive the output signals from the circuit stage pair for detecting direction of rotation to trigger a signal indicative of the direction of rotation of the target wheel.

Claim 4 (Currently Amended). The sensor assembly of claim 1 ~~2~~ wherein each circuit stage for sensing direction of rotation comprises a peak and valley detector.

U.S. Serial No.: 10/615,112
Amendment dated June 27, 2005
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Claim 5 (Currently Amended). The sensor assembly of claim 4_2 wherein each circuit stage for sensing direction of rotation comprises a zero-crossings detector.

Claim 6 (Original). The sensor assembly of claim 1 wherein said first circuit comprises a single circuit stage coupled to receive a signal from a respective one of the sensing elements.

Claim 7 (Currently Amended). The sensor assembly of claim 4_6 further comprising a flip-flop coupled to receive the ~~an~~ output signal from the single circuit stage and an output signal from the second circuit to trigger a signal indicative of the direction of rotation of the target wheel.

Claim 8 (Currently Amended). A method for independently sensing direction of rotation and/or position of an object, the method comprising:

providing a target wheel;

arranging a pair of sensing elements to generate respective signals as the wheel rotates in response to structure on the target wheel;

coupling a first circuit to directly receive a signal from at least one of the sensing elements for detecting direction of rotation of the target wheel; and

coupling a second circuit to directly receive each signal from the sensing elements for detecting position of the target wheel, wherein the detecting of direction of rotation by said first circuit is independent from the detecting of position by said second circuit.

Claim 9 (Original). The method of claim 8 wherein coupling said first circuit comprises coupling a pair of circuit stages, each of said stages coupled to respectively receive a signal from a respective one of the sensing elements.

U.S. Serial No.: 10/615,112
Amendment dated June 27, 2005
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Claim 10 (Currently Amended). The method of claim 9 further comprising triggering a signal indicative of the direction of rotation of the target wheel in response to a timing relationship between the output signals from the circuit stage pair.

Claim 11 (Currently Amended). The method of claim 9 further comprising detecting peaks and valleys in the signals received by each circuit stage from a respective one of the sensing elements.

Claim 12 (Currently Amended). The method of claim 9 further comprising detecting zero crossings in the signals received by each circuit stage from a respective one of the sensing elements.

Claim 13 (Original). The method of claim 8 wherein coupling said first circuit comprises coupling a single circuit stage to receive a signal from a respective one of the sensing elements.

Claim 14 (Currently Amended). The method of claim 8 13 further comprising triggering a signal indicative of the direction of rotation of the target wheel in response to a timing relationship between ~~the~~ an output signal from the single circuit stage and the second circuit.